GEDIA Gebrüder Dingerkus GmbH

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Founded in 1910, GEDIA is a family-owned company and a well-known supplier to the international automotive industry. The company develops and manufactures structural parts and assemblies for automobile bodies and chassis, produces functional components that meet the stringent crash requirements in vehicle construction, and supplies engine components. GEDIA employs some 4,800 people at its headquarters in Attendorn, North Rhine-Westphalia, and at eight other production sites in the USA, Mexico, Poland, Spain, Hungary, India and China. In addition to comprehensive expertise in all standard technologies for lightweight automotive construction, the company is continuously advancing its capabilities in emerging technologies and is involved in a range of joint ventures and research projects.

INDUSTRY
Automotive industry

NUMBER OF EMPLOYEES
4,800

LOCATION
Attendorn (Germany)

TRUMPF PRODUCTS

- TruLaser Cell 8030 with automation

APPLICATIONS

- Laser cutting
- Automation

Challenges

Automotive supplier GEDIA produces body parts of various sizes. This range requires a high level of production flexibility. Cost-effective automation is often difficult to achieve. When GEDIA secured an order to manufacture a large number of longitudinal beams, conditions finally aligned in favour of automation. "After initial planning, it was clear that we could use at least two lasers at 100% capacity for this one item. The containers required for automation were supplied by the customer. "Perfect conditions," says Pascal Kaufmann, Head of Production at GEDIA. In addition to the number of parts, the weight and dimensions of the longitudinal beam also required automated processing. Weighing around 8 kilograms and measuring about 1.80 metres in length, they were too difficult for employees to handle.

Kaufmann and his colleague Björn Müller, Project Manager for Capital Goods in Machine and Building Management at GEDIA GmbH, called on TRUMPF for assistance. In a joint workshop with TRUMPF experts and specialists from solutions partner Autom8, they explained exactly what they would need from a fully automated process. "Container management was a crucial area," says Müller, explaining: "We need specialist containers for an automated process. Purchasing them is expensive, and the associated handling and storage further reduce cost-effectiveness". Quality assurance through suitable camera systems and sophisticated gripper technology were also on the agenda. "Parts produced from hot forming usually have a funnel shape and a rough surface. They are stacked for further processing on the laser. Automated gripping and, above all, separating the parts is quite a challenge", says Müller. Last

but not least, there was only limited space available for automation.

TRUMPF and Autom8 come up with a compelling solution, whereby two existing TruLaser Cell 8030 machines are fitted with an innovative single-robot automation. Its compact design allows for both automated and manual operation of the TruLaser Cell 8030, making it ideally suited to the available space in GEDIA's production facility. But shortly afterwards, flexibility was required again as changes in quantities required the automation of another TruLaser Cell 8030. However, since this system can only be used to half its capacity for the production of the longitudinal bar, it was difficult to know what to do for the best. Based on their positive experiences with the first two automation projects, Kaufmann and Müller are now taking the next step and commissioning a fully automated system that will allow the longitudinal beam and another similarly sized part to be produced around the clock, with minimal setup time and little operator intervention.

"TRUMPF assumed overall responsibility in partnership with Autom8, giving us the confidence of receiving a complete solution from a single source."

BJÖRN MÜLLER

PROJECT MANAGER FOR CAPITAL GOODS IN MACHINE AND BUILDING MANAGEMENT AT GEDIA

Solutions

GEDIA wanted a space-saving solution for the one-robot automation of its two existing systems. The clever safety concept with fold-away safety door on one side of the system meets this requirement. For greater flexibility, the systems offer the option of hybrid processing. In addition to automated operation, manual operation is still possible.

The fully automated TruLaser Cell 8030 works with a loading and unloading robot to speed up the machining processes on the laser. To enable continuous operation, buffer zones are established above the laser working area, allowing robots to temporarily store parts when containers have not yet been changed. A fixture specifically designed for automation, featuring a pneumatic ejector for part removal, further enhances processing speed. It saves the robot a movement sequence.

The grippers with bin picking technology ensure reliable parts handling. The camera-based solution can also reliably pick up complex parts, irrespective of their position. In the new machine, a scanner-based camera system ensures even more reliable quality assurance. Regardless of lighting conditions, the scanner detects whether all processing steps have been carried out correctly, even on dirty parts.

Implementation

The two existing machines, which are already automated, have a robot that removes the semi-finished parts from the hot forming process –stored in containers designed for automated handling – and feeds them to the TLC8030. The advanced camera-based gripper technology includes stripping bolts to release

parts stuck in the stack. Additionally, an external camera system monitors the laser machining process. Once the laser processing has been completed, the robot deposits the finished parts in another container. Since the cutting process takes some time, a buffer zone is set up above the laser, where the robot can place parts to be processed. This creates a larger window of time in which employees can remove empty containers and replace them with new ones without causing the machine to stop. The space-saving safety concept is a particularly neat solution. "Our laser systems are located close together," says Kaufmann, adding: "There is enough space for manual operation, but the safety housing of the automation takes up a lot of space." The solution: a fixed enclosure that surrounds only the robot's workspace. The other side of the machine is secured by a sliding door that can be folded away completely to the rear. Markings and scanners placed on the floor replace the fixed housing on this side of the system. "If this limit is exceeded slightly, the robot slows down without stopping work entirely," explains Müller. "The machine only stops and requires a restart when an employee or piece of equipment comes very close to the system."

Two robots operate the fully automated TruLaser Cell 8030 system. On one side, one robot removes the semi-finished parts from one of the two containers and feeds them to the machine. Here too, a material buffer installed above the loading station allows containers to remain empty for short periods without causing the robot to stop due to a lack of parts. A robot positioned opposite removes the processed parts and places them into designated containers. When these are full, the material buffer serves as a temporary storage area.

The machine runs 24/7 and only the replacement of the containers is carried out by employees. A scanner-based camera also ensures that all processing steps are carried out according to quality specifications. "We use this machine to produce part of the longitudinal bars as well as a sill plate with similar dimensions," says Müller. This makes it possible to produce both parts automatically on the same machine without any major setup work.

Forecast

"It was a successful collaborative project", says Pascal Kaufmann, continuing: "We worked as equals to develop solutions tailored to our specific requirements. TRUMPF assumed overall responsibility in partnership with Autom8, giving us the feeling of receiving a complete solution from a single source." Kaufmann also fondly recalls the flexibility: "Whenever we proposed a new idea and asked if it could be implemented, both TRUMPF and Autom8 were responsive and receptive to our suggestions."

GEDIA remains committed to automation in the future to streamline processes and further enhance overall performance. "We can deploy our employees more effectively if we automate more. But we also

have to think very carefully about where it makes sense to do so. Individual solutions are particularly important."

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